

PRIOLEPIS GOLDSHMIDTAE (GOBIIDAE), A NEW SPECIES FROM THE DEEP WATER OF THE NORTHERN GULF OF AQABA, RED SEA

by

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ABSTRACT. - *Priolepis goldshmidtiae* n. sp. was collected at a depth of 400 m in the northern Gulf of Aqaba, Red Sea. The new species is characterized by LS 26-27; PreD 15; D: VI, I 10-11; A: I 9; P 20-21. Gill opening to below rear margin of eye; 17-18 gillrakers, long and slender, lacking spicules. Body red (pale-brown in preserved fish) with 4-5 narrow, backward-directed light bars, a wide vertical bar in front of first dorsal fin and 3 forward-directed bars on head. *Priolepis* species are reef associated gobies and the present finding of this species at a depth of 400 m where no coral reefs exist, is an indication for the presence of hard substrate on the soft bottom of the deep sea.

RÉSUMÉ. - *Priolepis goldshmidtiae* n. sp., a été récolté à une profondeur de 400 m au nord du Golfe d'Aqaba en Mer Rouge. Cette nouvelle espèce est caractérisée par: LS 26-27, PreD 15, D VI, I 10-11, A I 9, P 20-21; ouverture branchiale en dessous de la partie postérieure de l'oeil; 17-18 branchiospines, longues, fines et sans spicules. Le corps est rouge (brun pâle après fixation) avec des lignes claires dirigées vers l'arrière, une ligne verticale, plus large, avant la première nageoire dorsale, et trois lignes dirigées vers l'avant, sur la tête. Les espèces du genre *Priolepis* sont des "gobies" généralement associés au corail et la découverte de cette espèce à 400 m de profondeur où le corail n'existe pas, indique la possible présence de substrat solide sur les sédiments friables du fond.

Key-words. - Gobiidae, *Priolepis goldshmidtiae*, ISW, Red Sea, Deep Sea, New species, Taxonomy.

The ecological conditions in the deep water zone of the Red Sea (including Gulf of Aqaba, its northern extension) are unique. Temperature below the depth of 200 m. is quite high and constant (21°C-22°C). Salinity is also relatively high with little fluctuation (4.01-4.05%) during the year (Reiss and Hottinger, 1984).

Although the unique ecological conditions in the deep water zone of the Red Sea presents a challenge to marine biogeographers, the fauna of this region is poorly known in comparison with the well investigated coral reef zone. Klauswitz (1986, 1989) and Baranes and Golani (1993) concluded that the deep water fishes of the Red Sea are either of shallow water origin or deep water immigrants from the Indian Ocean which "filled" the ecological vacuum in the deep water region of the Red Sea.

In the course of a study of the deep sea fish fauna in the Gulf of Aqaba (Baranes and Golani, 1993), two specimens of a small goby were collected at a depth of 400 m. The great majority of the ninety six Red Sea gobies are found in the shallow water. The only deep water goby known so far from the Red Sea is *Obliquogobius turkayi* (Goren, 1992) which was

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found in the central Red Sea, at a depth of 434-496 m. *Obliquogobius* is a mesobenthic, soft bottom genus whereas the *Priolepis* species are usually reef associated gobies (Winterbottom and Burrige, 1992b). The present finding of the new species is of special interest as at a depth of 400 m, well below the photic zone, there are no coral reefs.

MATERIALS AND METHODS

Measurements (in mm) and counts were made as follows: longitudinal scale counts (LS) were made from the upper attachment of the opercular membrane to the hypural. Transverse scale counts (TR) were taken anterodorsally from the origin of anal spine. Predorsal scales were counted from the origin of dorsal fin to mid interorbital space. [Note: as specimens were damaged and had lost most of their scales, the squamation study was based on scale pockets which are strongly outlined with chromatophores]. Standard length (SL) was measured from snout tip to the end of the hypural, total length (TL) from the snout tip to the end of the caudal fin, body depth (BD) a vertical from the origin of first dorsal fin, head length (HL) from snout tip to upper attachment of the opercular membrane. Body depth was measured as a vertical line from the origin of first dorsal fin. Eye diameter (E) is the longest diameter when eyes are not round. SD1, SD2, SA represent the distances from the snout tip to the origin of the first dorsal fin, the origin of the second dorsal fin and the origin of the anal fin, respectively. Gill rakers (GR) were counted on upper arch, angle, and lower arch of anterior gill.

Other abbreviations: D2-second dorsal fin; A-anal fin, P-pectoral fin; C-caudal fin.

Values of holotype in description are underlined>.

PRIOLEPIS GOLDSCHMIDTAE N. SP.

(Fig. 1)

Material

The types are deposited in the fish collection of the Zoological Museum of Tel Aviv University (TAU). Holotype: TAU 10521, Paratype: TAU 10507. Both were collected by O. Goldschmidt with a beam trawl at a depth of 400 m opposite to the Interuniversity Institute in Eilat, Sept. 7 1992. Some measurements of types are presented in table I.

	Holotype TAU 10521	Paratype TAU 10507
TL	34.5	~
SL	31.8	27.7
HL	9.8	8.9
BD	7.4	5.9
E	3.1	3.0
SD1	11.2	10.0
SD2	17.3	14.4
SA	20.6	19.3

Table I. - Selected measurements (in mm) of holotype and paratype of *Priolepis goldschmidtiae*, n. sp.



Fig. 1. - *Priolepis goldshmidtiae*. Holotype. TAU 10521 (SL 31.8 mm).

Diagnosis

Priolepis goldshmidtiae is characterized by possessing 15 predorsal scales, reaching to above mid eyes. LS 26-27; TR 12; D: VI, I 10-11; second dorsal spine with a long filament, reaches the caudal peduncle. A: I 9; P 20-21; gill opening to below rear margin of eye; GR 17-18, long and slender, lacking spicules. Body red (pale-brown in preserved fish) with 4-5 narrow, backward directed light bars, a wide vertical bar in front of first dorsal fin and 3 forward directed bars on head.

Description

Body elongate and compressed. Mouth is strongly oblique with projecting lower jaw. Maxilla extends to below front of eye. 4-5 rows of backward curved teeth on both jaws. Inner teeth slightly enlarged, outer teeth enlarged, remaining teeth minute. Posterior nostril in front of eye and anterior nostril close above upper jaw, both short tubes. Isthmus narrow. Gill opening to a vertical from rear margin of eye. Gill rakers on anterior gill arch 4-5+1+12, long and slender. No denticles or odontodes on median surface of outer gill rakers of anterior gill arch.

Low bony ridge on front predorsal (to above mid eye) where it turns into a groove. Interorbital space narrow, about one fifth of eye diameter. Cephalic pores absent.

Since both types were slightly desiccated before preservation, it is impossible to trace the full papillae pattern on head. However, from examination of the holotype (which is slightly better preserved than the paratype) a transverse pattern can be recognized.

Scales. - 26-27 scales along the body, 12 transverse scale rows, 15 predorsal scales reaching to above middle of eye, 3-4 series of scales on opercle. Scales on pectoral base and prepelvic region.

Fins. - D VI, I 10-11 all rays branched, except last posterior element of last ray; A I 9 all rays branched, except last posterior element of last ray; P 20-21 rays 3-15 branched two lower rays are not divided, five upper rays are broken and cannot be checked; V I 5; C 22 (16 branched). Dorsal fins lower than body depth except for the second filamentous spine which reaches the caudal peduncle. Anal fin inserts below the origin of second ray in second dorsal fin. Pelvics completely separated. Fraenum absent.

Proportions (%). - Head length/SL 28-31%; body depth/SL 19-23%; eye diameter 31% of head length; interorbital/eye diameter 18-22%; pectoral fin length 20-25% of SL; pelvic fin length 13-17% of total length; longest dorsal spine (filamentous)/SL 51%; SD1/SL 32-35%; SD2/SL 47-53%; SA/SL 61-65%.

Colour. - Body red (pale-brown in preserved fish) with 4-5 narrow, backward directed light bars, a wide vertical bar in front of first dorsal fin and 3 slightly forward directed bars on head. A round black blotch on posterior part of first dorsal fin.

Etymology. - The species is named after Ms. Orit Goldshmidt of the Interuniversity Institute, of Marine Sciences, Elat, who collected the fish.

Key to the Red Sea species of *Priolepis*

- 1a. Predorsal unscaled.....*P. semidoliatus* (Valenciennes, 1837)
- 1b. Predorsal scaled..... **2**
- 2a. 35-38 scales along the body.....*P. cinctus* (Regan, 1908)
- 2b. 26-27 scales along the body.....*P. goldshmidtiae* n. sp.

DISCUSSION

Although the new species lacks spicules or odontoids on the gill rakers of the anterior gill arch we assign it to *Priolepis* as it possesses some *Priolepis* characteristics (as defined by Winterbottom and Burrige, 1988) such as restricted gill opening, vertical bands on body, extensive squamation on head and apparently transverse pattern of papillae on cheek. This unclear situation is probably the outcome of the polyphyletic origin of the genus *Priolepis* which is expressed in fundamental differences between the various species of this genus. Winterbottom and Burrige (1992a: 1945) stated that "...*Priolepis* is not monophyletic (and has some species more closely related to *Trimma* and allied genera than to other *Priolepis*)". Under these circumstances, when even the generic allocation of the species is problematic, it is difficult to establish the relationship of the new species with its congeners. It apparently belongs to the species group of *Priolepis profundus* (as defined by Winterbottom and Burrige, 1993) which is characterized by a transverse pattern of sensory papillae and predorsal scales. It shares with the majority of this 10 member group the same counts of scales and rays in dorsal and anal fins. However, it can be easily distinguished from all them by its unique color pattern (especially by the narrow, backward directed light bars on the body) and by the absence of spicules or odontoids on the gill rakers.

An interesting aspect of the finding of *Priolepis goldshmidtiae* is the ecological one. Species of the genus *Priolepis* inhabit hard substrate, especially coral reefs (Winterbottom and Burrige, 1992b). As it is unlikely that the new species has been developed into sand dwelling species, its finding in an area of soft bottom at a depth of 400 m is apparently an indication of the existence of "islands" of hard substrate which can support the speciation of this deep sea fish.

As *Priolepis goldshmidtiae* has no closely related species in the Red Sea which could share common origin, we assume that this species is either a relict of the glacial or preglacial period or, more likely, a representative of a group of *Priolepis* which inhabits the deep water the Indian Ocean but has not been yet found due to technical reasons.

Acknowledgements. - We are grateful to Dr. R. Winterbottom for examining the paratype of the new species and for his useful advice. We also thank Ms. Orit Goldshmidt for providing the material of the new species, Mr. A. Shub for the photographs and Ms. N. Paz for editing the manuscript.

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Reçu le 12.12.1994.

Accepté pour publication le 27.06.1995.